



ESTOC

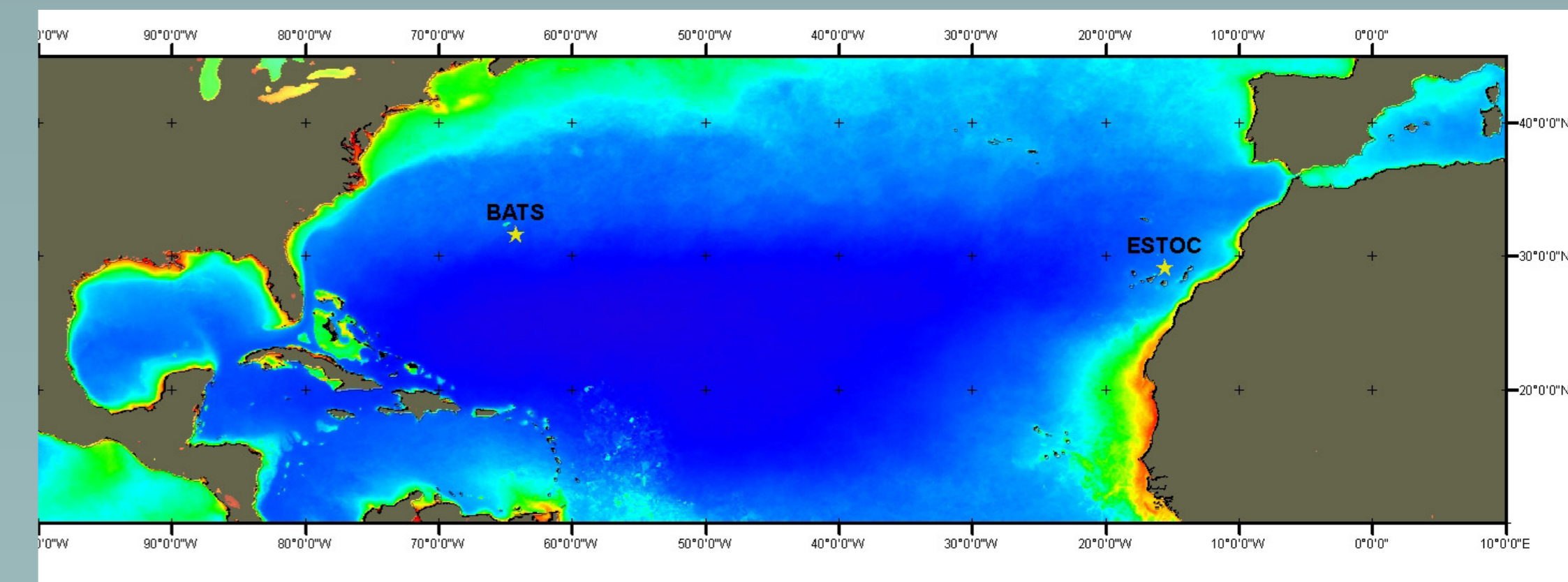


European Station for Time-Series in the Ocean, Canary Islands

PIs: Dr Octavio Llinás and Dr Melchor González-Dávila



ESTOC goal: The creation of an eulerian long time series on an inter- and multidisciplinary basis in order to monitor and help understanding oceanic long-term variability in the North Atlantic subtropical gyre in conjunction with the Bermuda Atlantic Time-series Study (BATS). PLOCAN, ICCM, IEO and ULPGC are currently the main institutions involved.



Monthly/Seasonal Observational Basic Program

Discrete Water Sampling: The samples were collected using a CTD/ROSETTE with Niskin bottles of 5-10l, or these bottles fixed on stainless-steel hydrowire. **Sampling sequence:** Dissolved Oxygen, pH, alkalinity, Dissolved Inorganic Carbon, Nutrients, Salinity, Chlorophyll a, Phytoplankton pigments. All samples were taken using the procedures established in the WOCE Operations Manual, WHP Office Report WHPO 91-1/WOCE Report No.68/91.

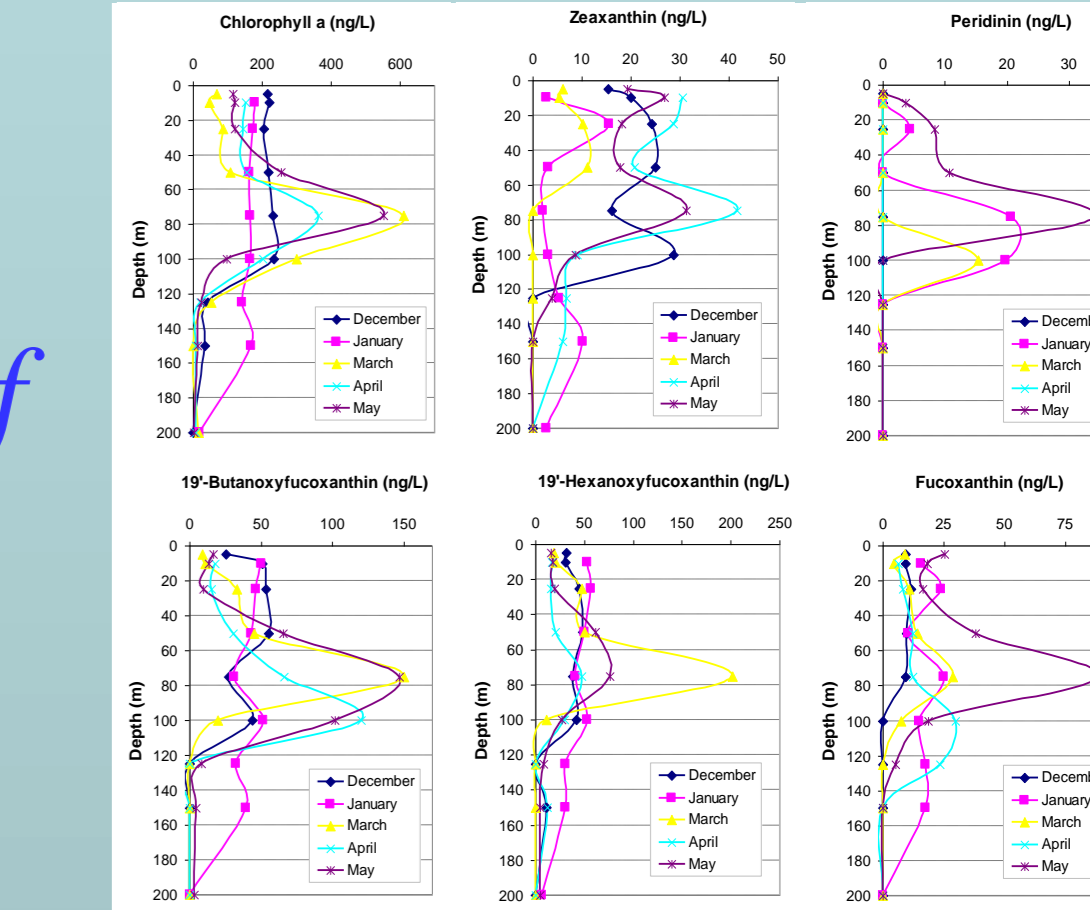
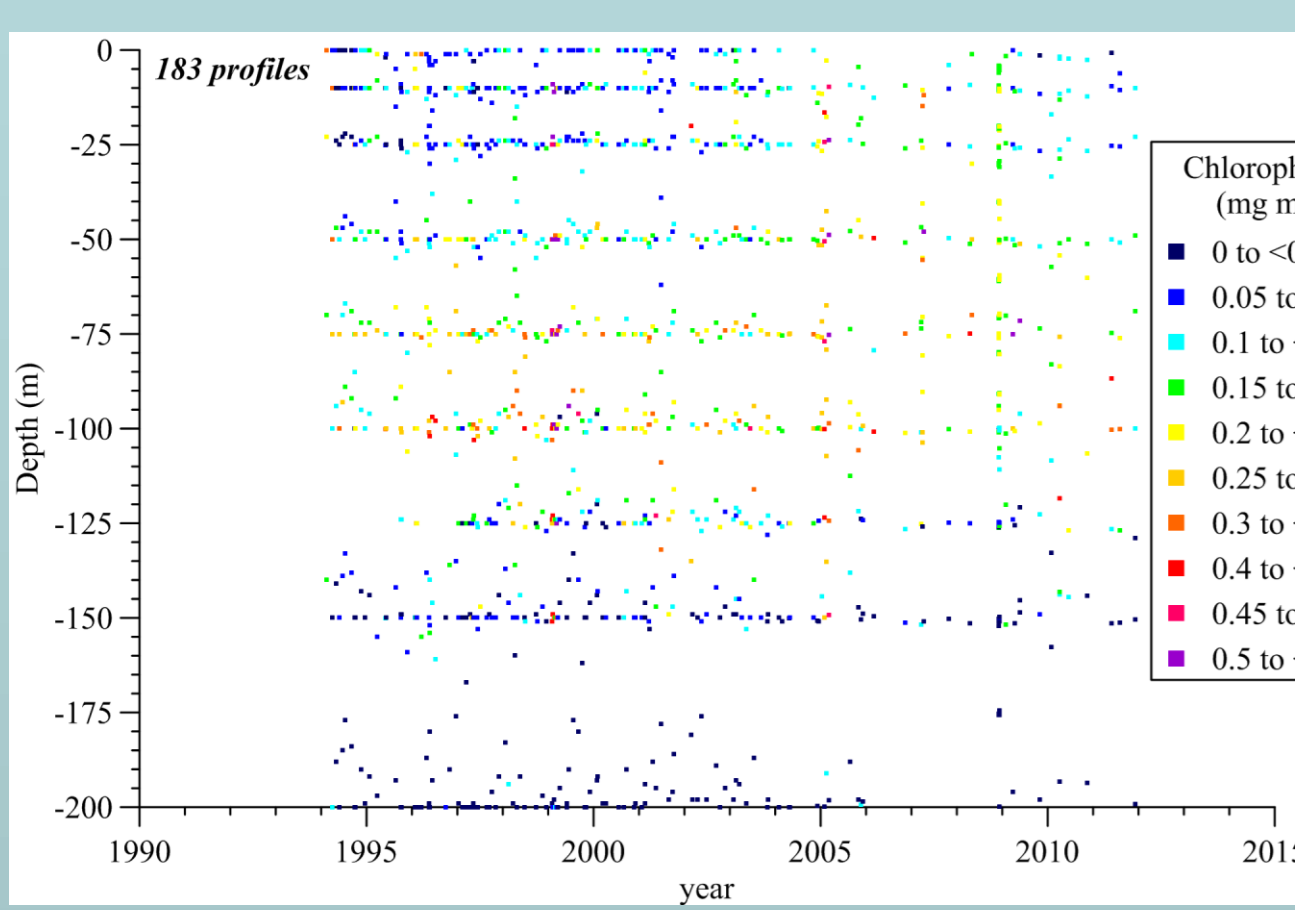
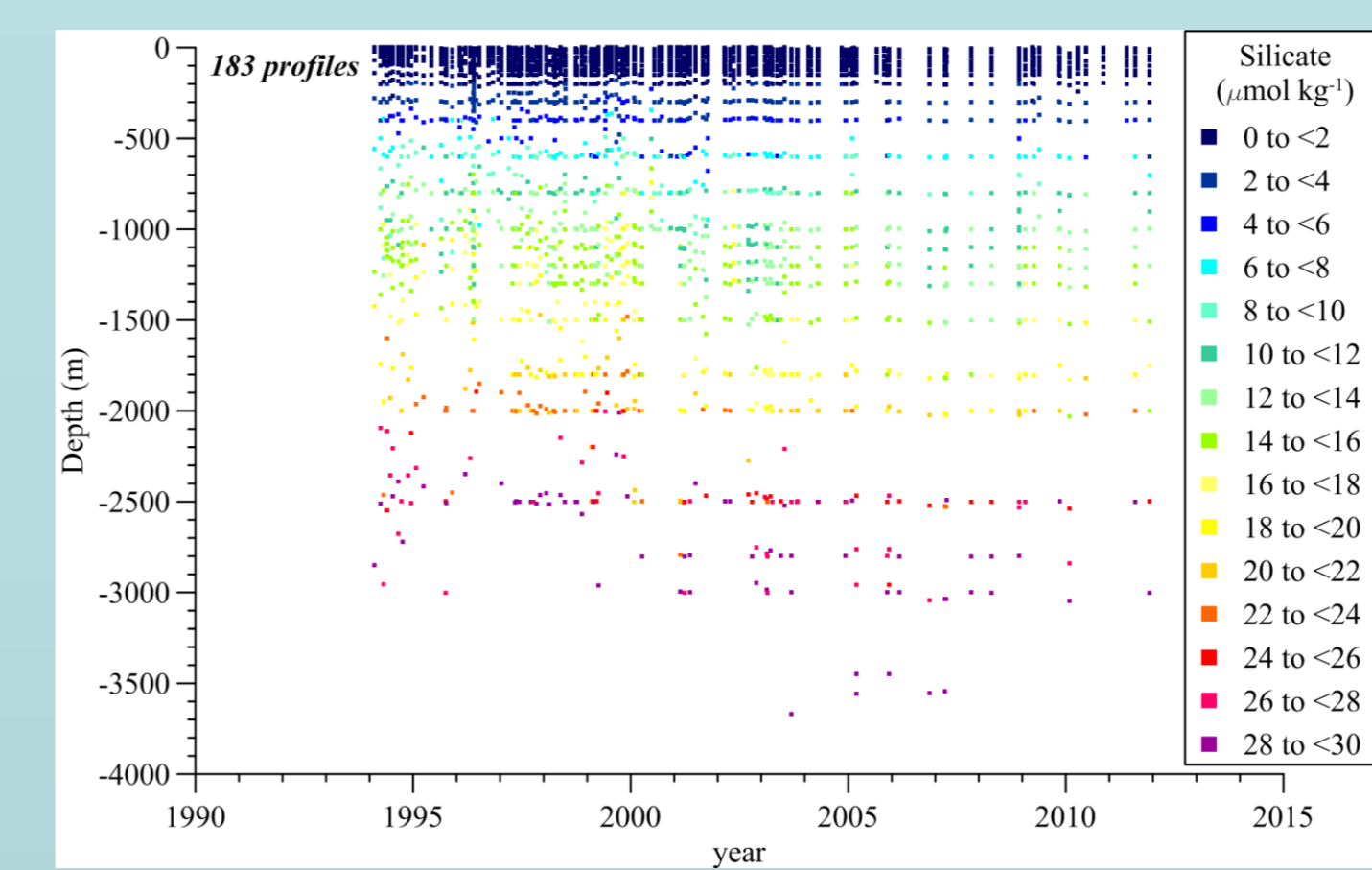
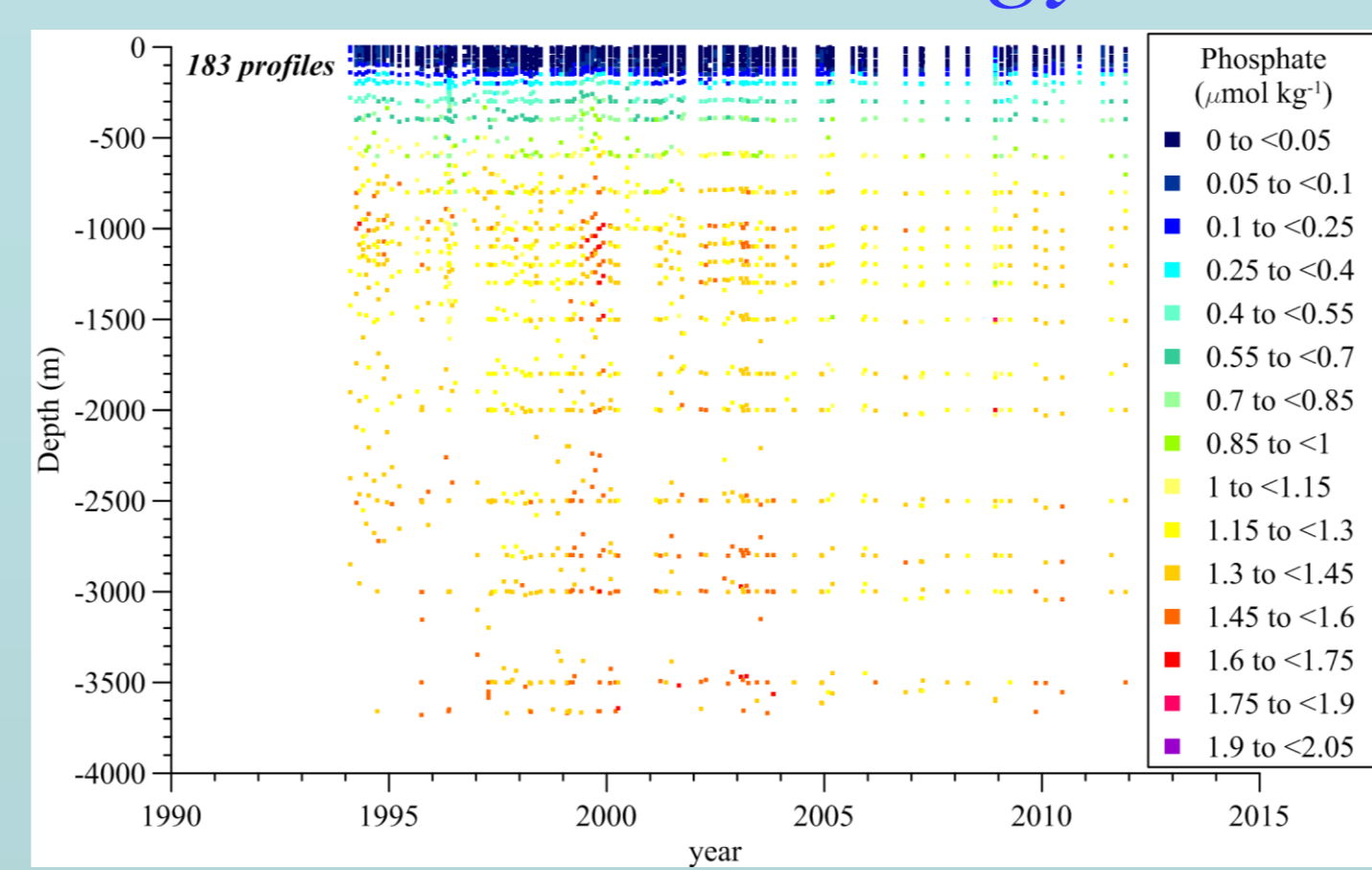
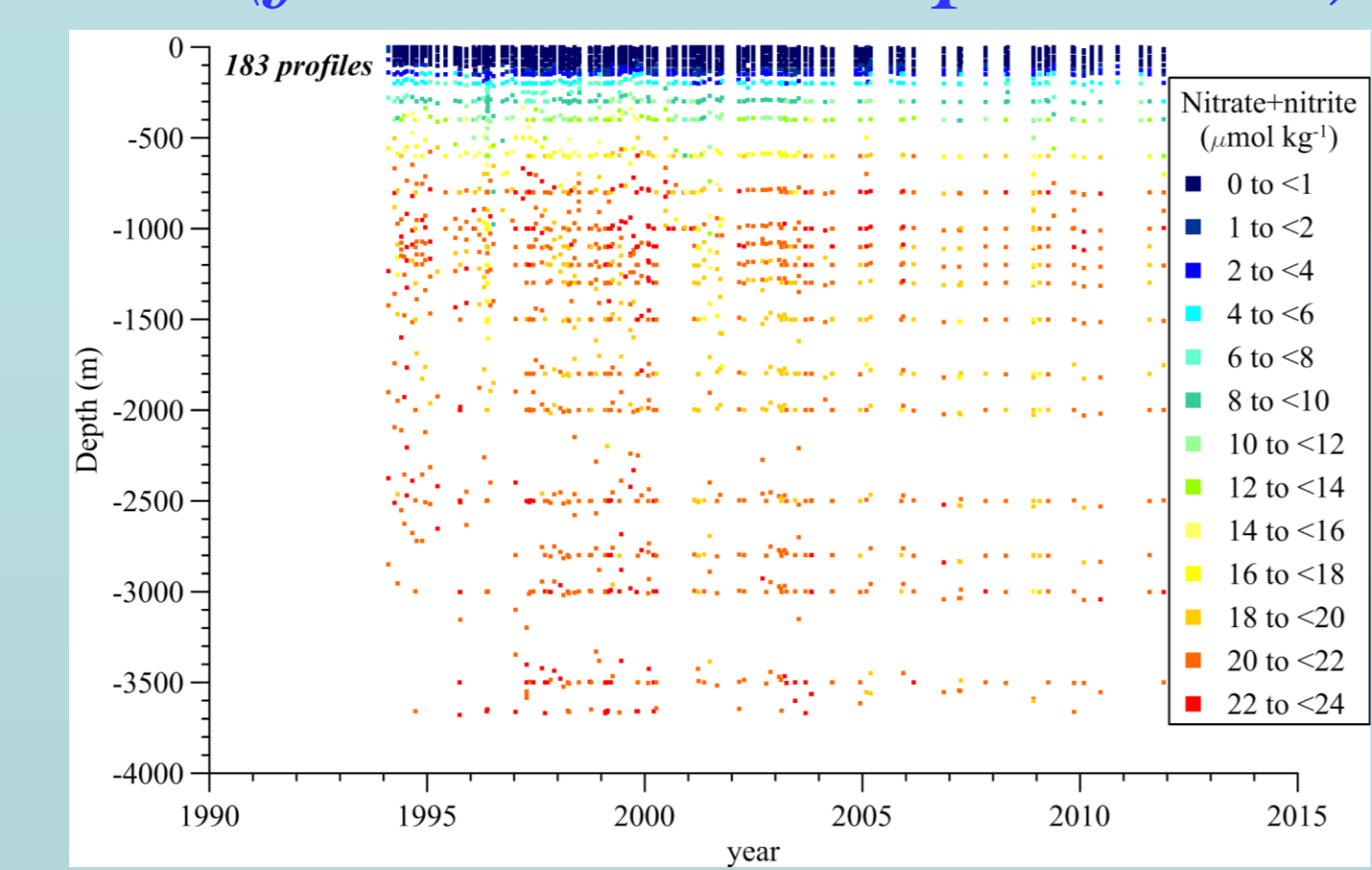
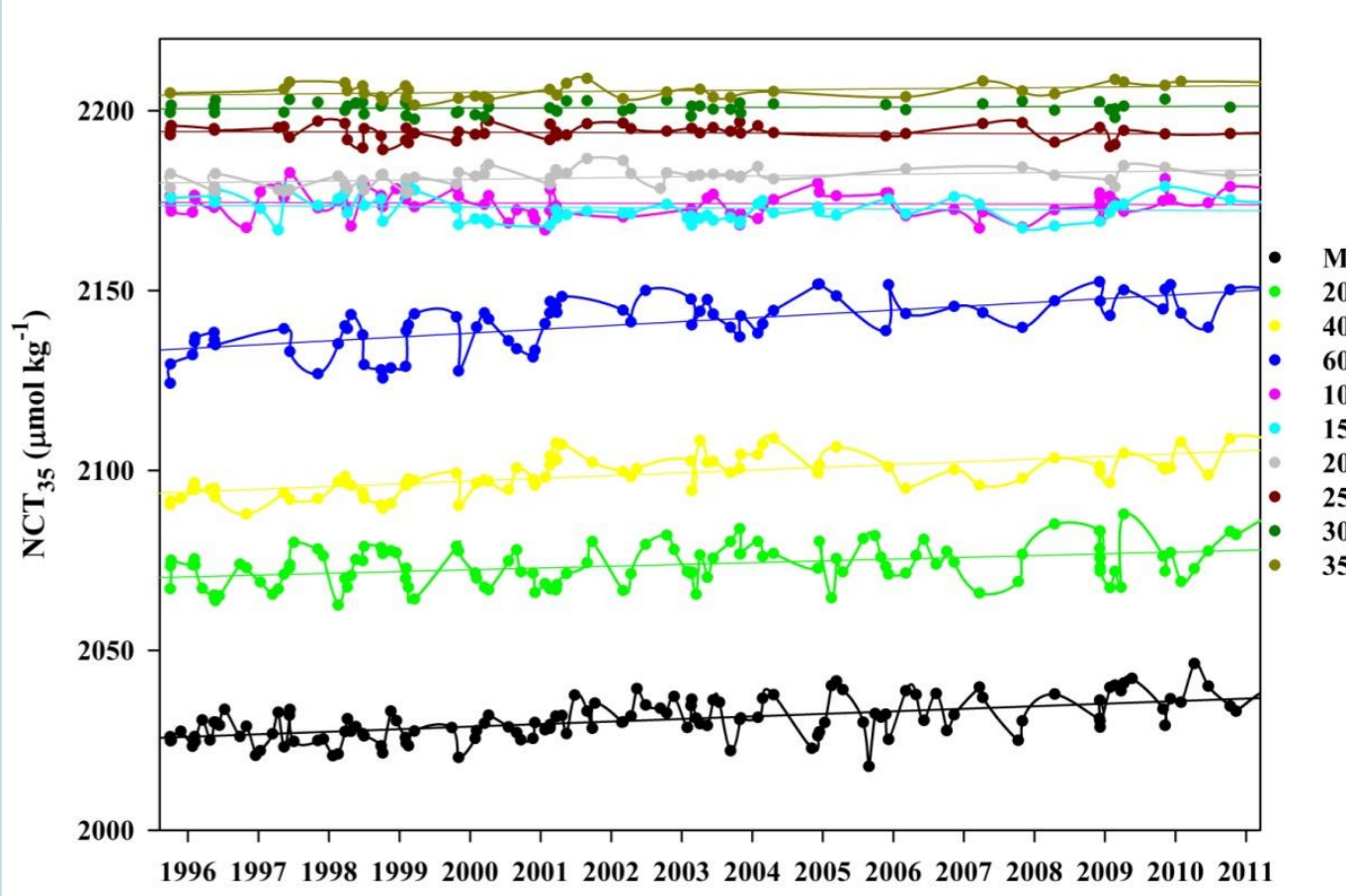
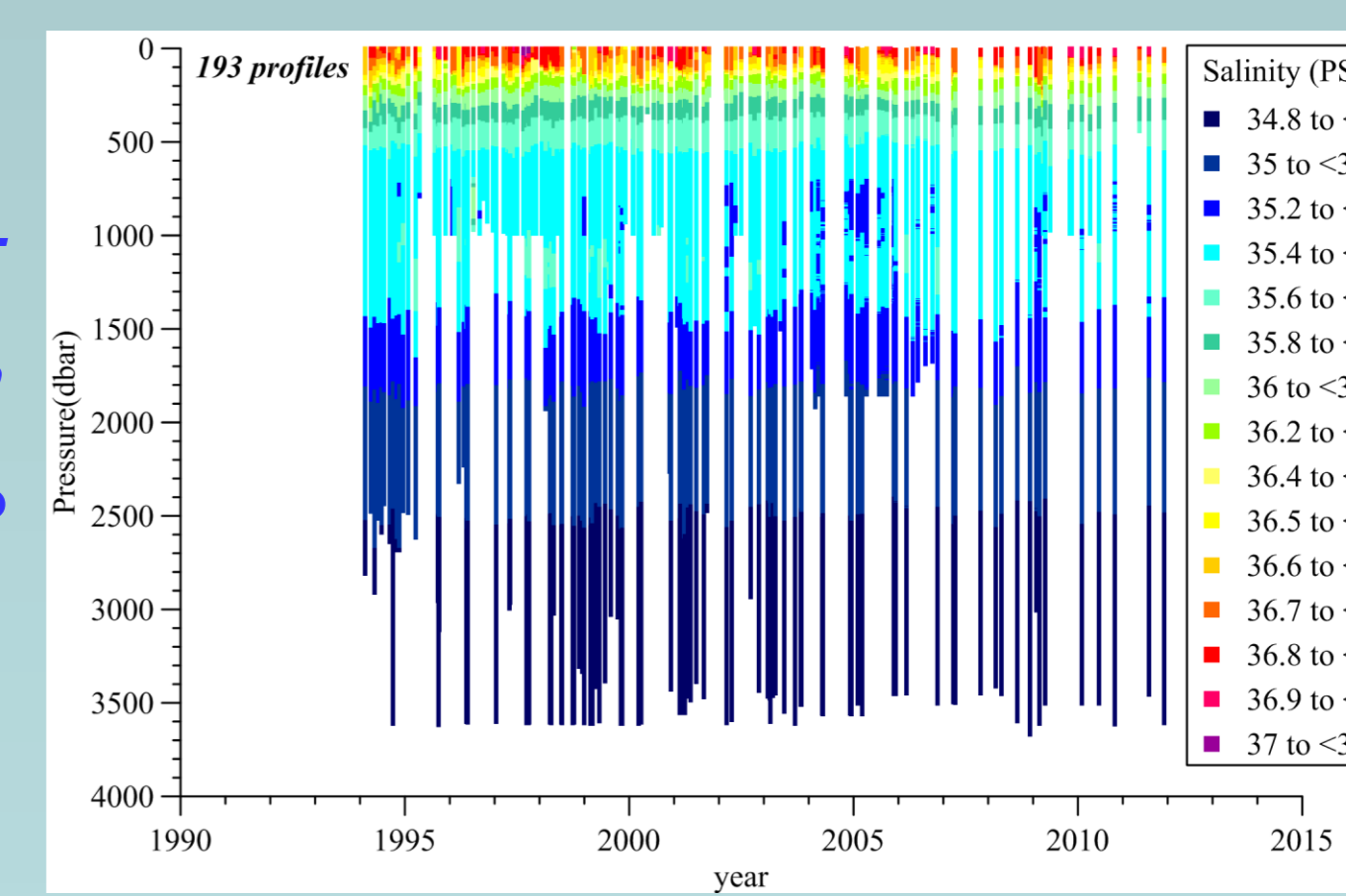
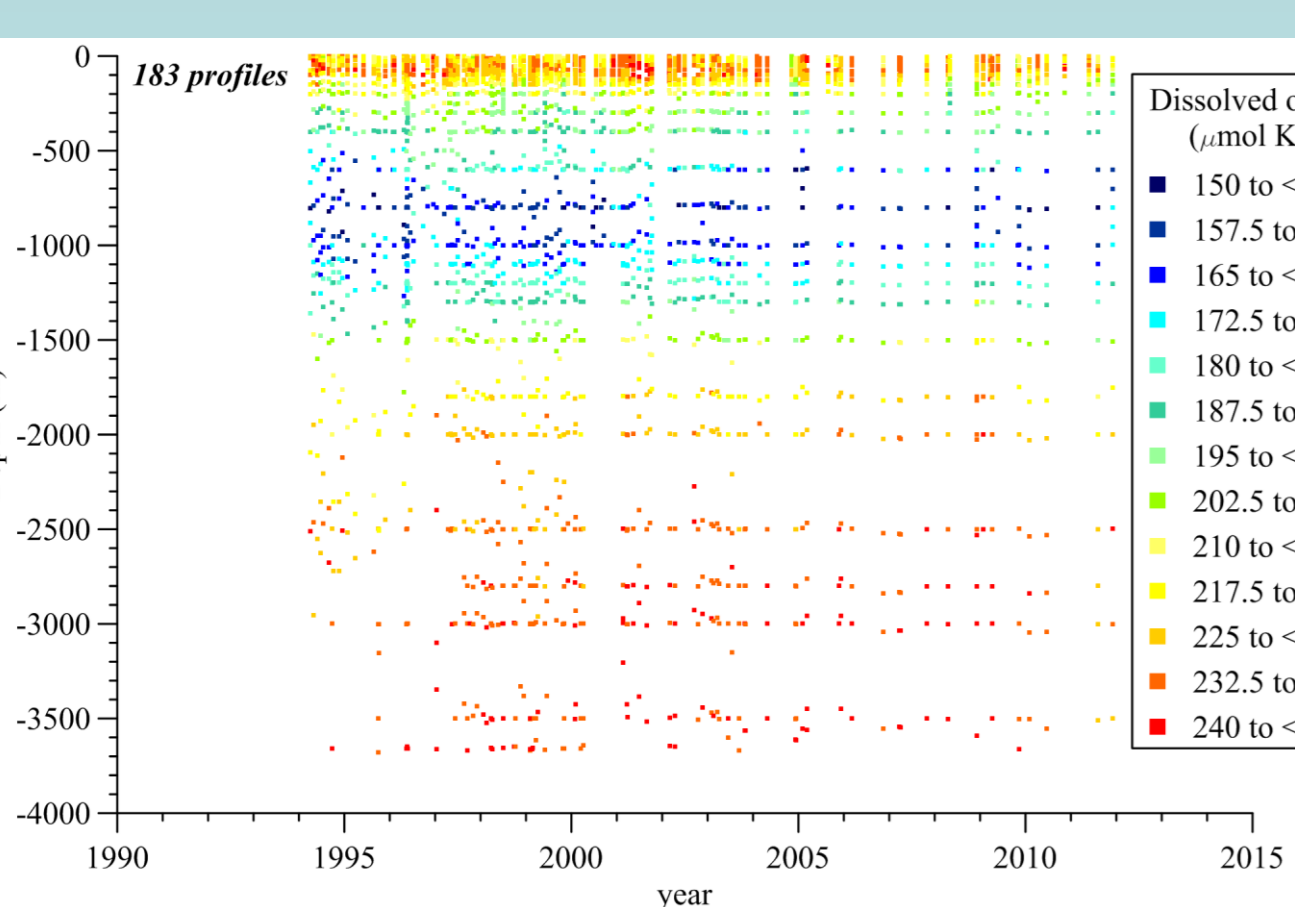
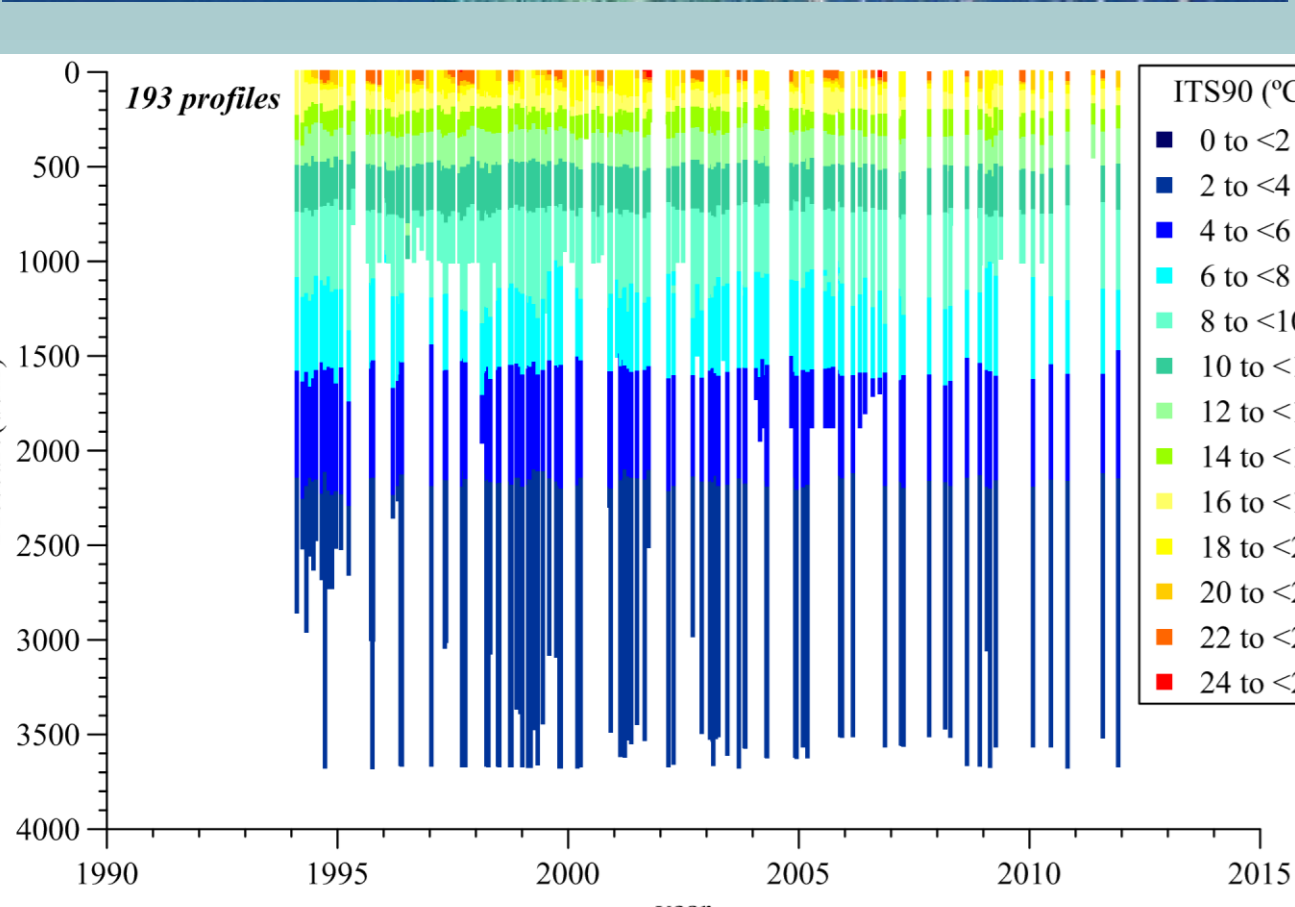
Temperature (ITS90), Salinity (PSS-78) and Depth/Pressure (m/dbar; Dr Cianca): Since 1994- measured by CTD, several brands used (FSI, MKIIB-NB, SIS, OS316 plus- ID, SeaBird 911). Calibrations in the factory. Salinity quality control by a salinometer, model Autosal 8400a (0.005-42psu ±0.003 accuracy. Standardization using IAPSO Standard Seawater. Salinity values according to UNESCO (1978, 1981, 1984).

Dissolved Oxygen ($\mu\text{mol kg}^{-1}$): method in the WOCE Report No. 68/91 (Culberson, 1991); Metrohm Dosimat Oxygen Auto-Titrator Analyzer.

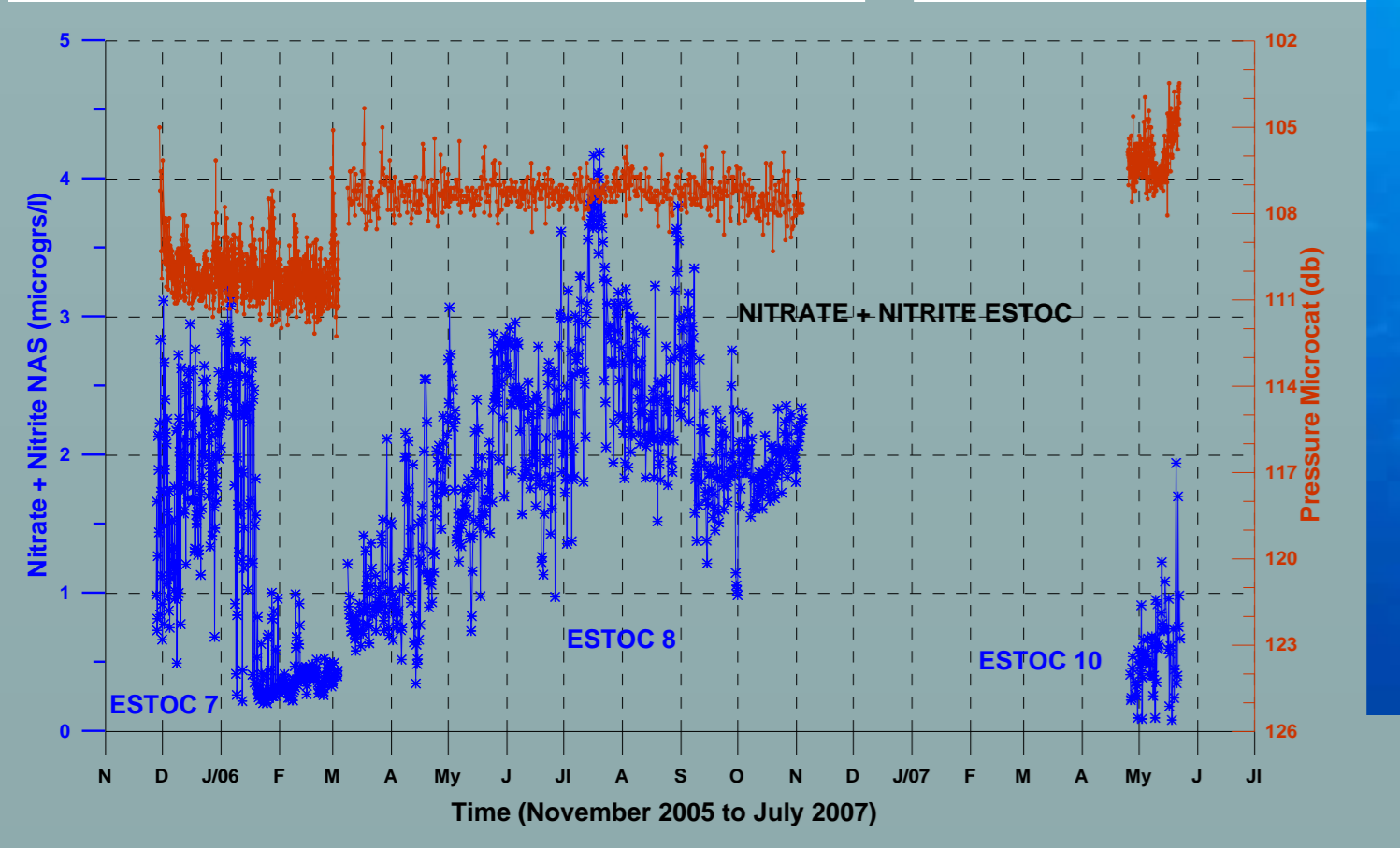
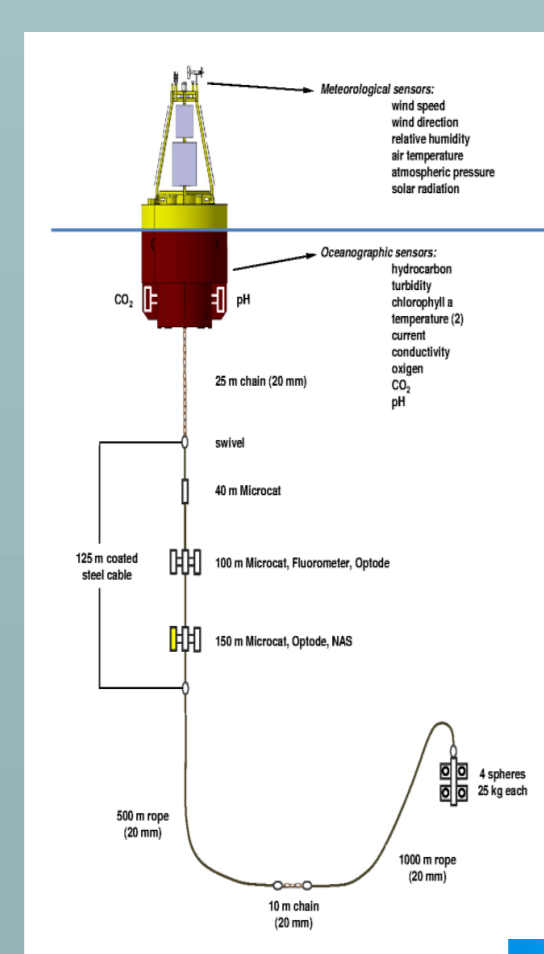
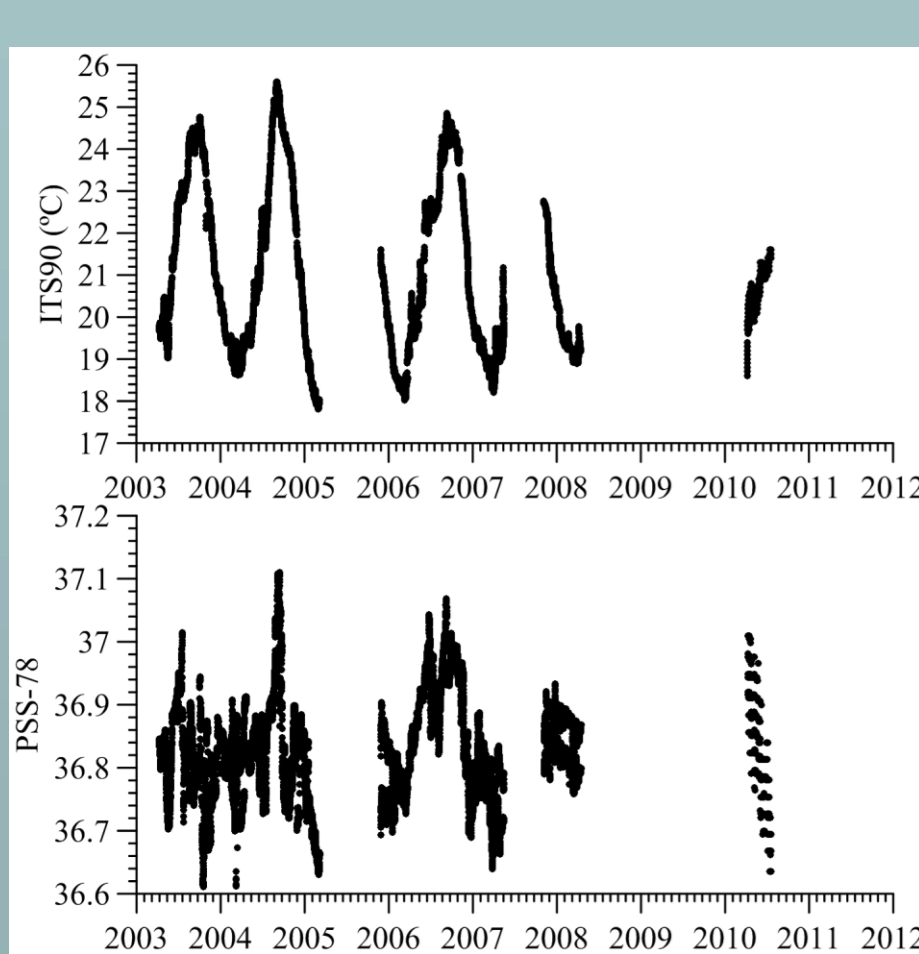
Carbon dioxide param. ($\mu\text{mol kg}^{-1}$; Dr González- Dávila and Dr Santana-Casiano): Spectrophotometric pH (Method based on Clayton and Byrne, 1993). Own design. VINDTA systems used for Potentiometric Alkalinity and Total Dissolved Inorganic Carbon (Coulometric titration).

Nutrients: Nitrate+Nitrite, Phosphate and Silicate ($\mu\text{mol kg}^{-1}$; Dr Llinás, Dr Rueda and Dr Santana): Since 1994. WOCE Operations Manual, WHP Office Report WHPI 91.1, WOCE Report No. 68/91. Samples were immediately frozen at -20°C and analyzed ashore. Spectrophotometer: AAI autoanalyzer 4-channel Technicon (1994) and segmented continuous-flow autoanalyzer Skalar (from 1995 to present). Nutrient methodology based on Strickland and Parsons (1968).

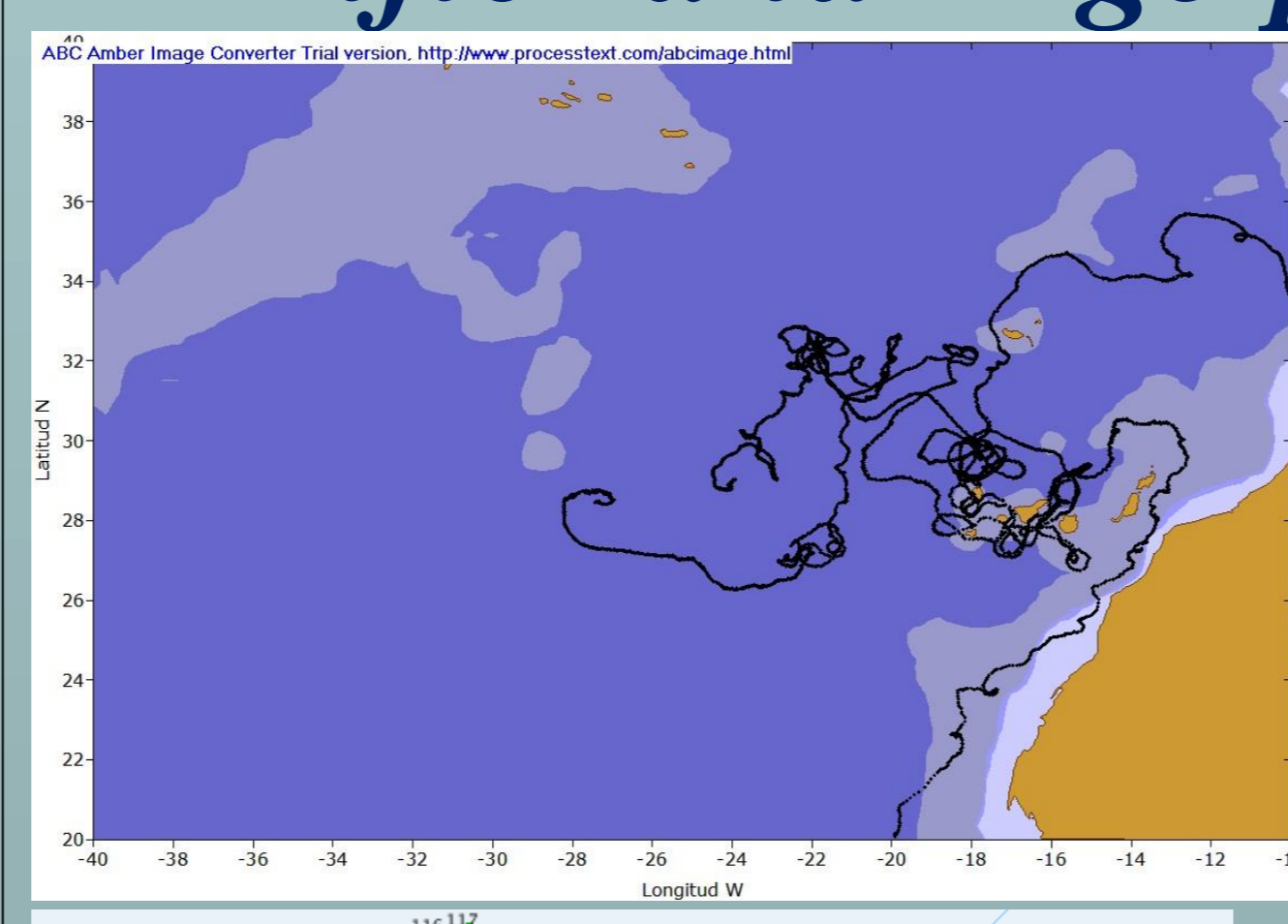
Pigments (Chlorophyll a): Since 1994. Non-acidification method, Turner fluorometer 10 AU (Welshmeyer, 1994). **Pigments (HPLC technique; Dr Daura Vega- Moreno):** Pigments are extracted in 100% methanol (5 ml) with the use of ultrasonication and clarified by centrifugation. Then analysed by reverse phase HPLC procedure (Wright et al., 1991), using a Waters Spherisorb 5 mm ODS2 4.6 250 mm C18 column.



Moored structures

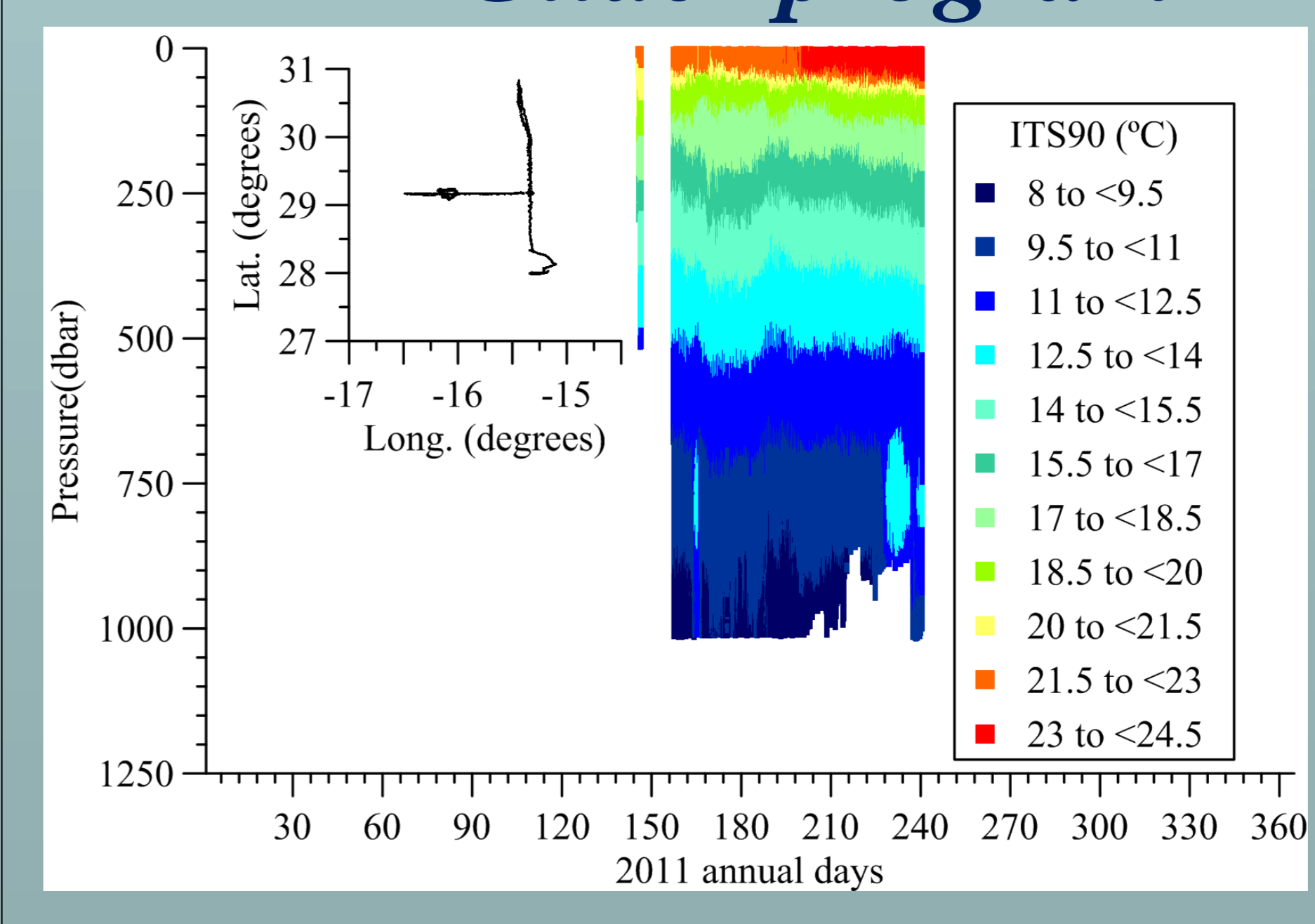


Drifter and Argo programs



128 drifters Launched since 1997. ICCM
Float Argo Trajectory. Date 14/09/2006 to 17/12/2011 IEO

Glider program



Seasonal Program. Flying around ESTOC site and along the 29° line